

Reachability Graph Statistics

This report has been generated by helena.

General information

Model analyzed	dbm
Model language	Helena
Model parameters	N = 10
Analysis date	November, 30, 2017 at 09:37:24
File path	/home/sami/git/helena/examples/dbm.lna

Size information

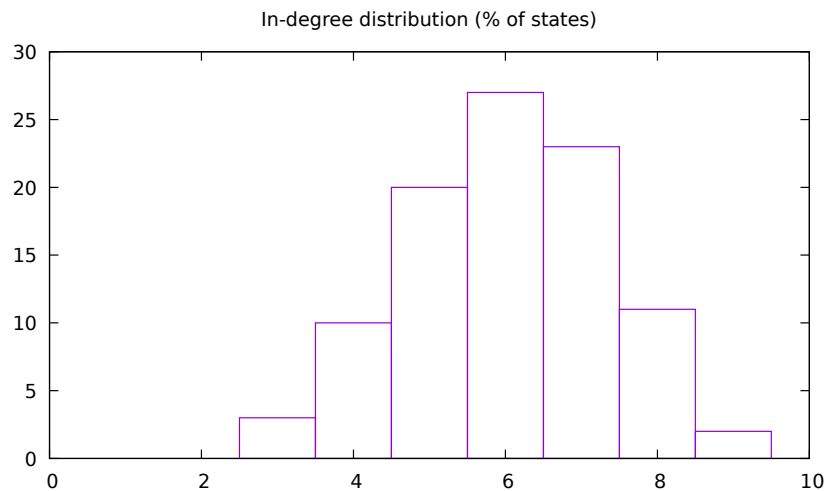
States	196831
Edges	1181000

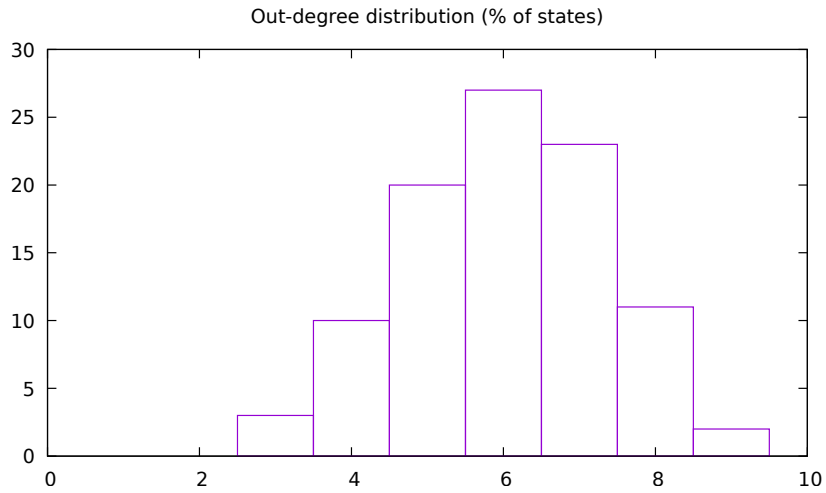
Strongly connected components (SCC) information

Number of components	1
Number of trivial components	0
Number of terminal components	1
Size of the largest component	196831

Degrees information

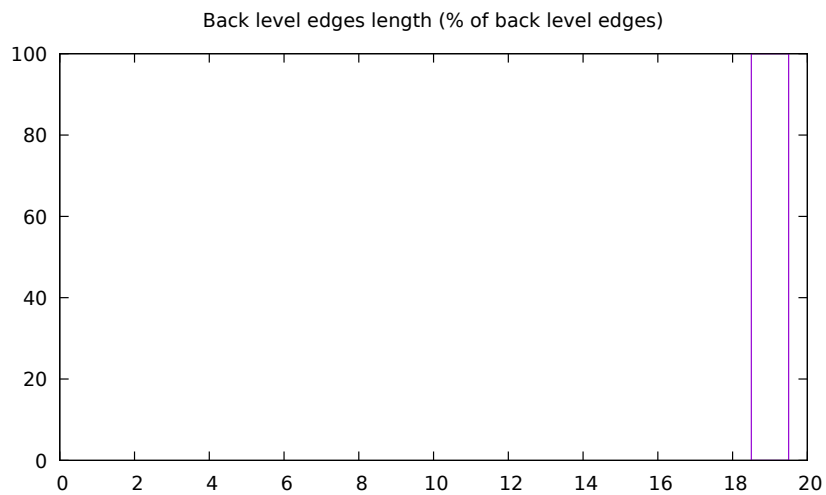
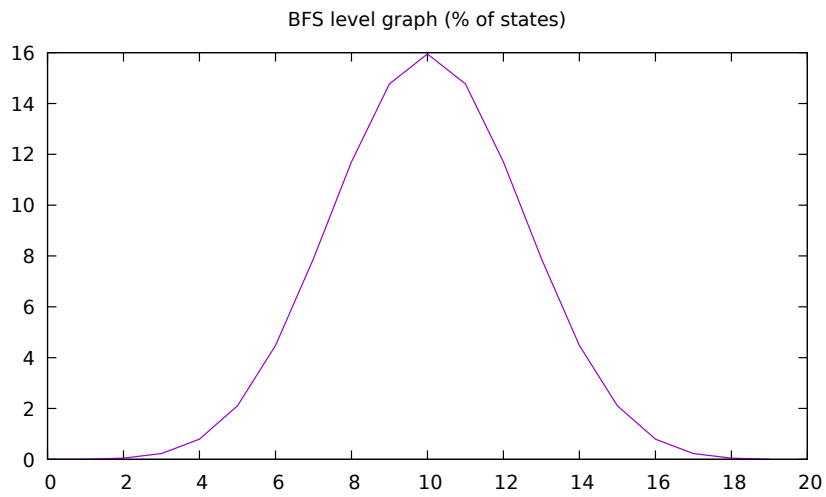
Average degree	6.0001
Maximal in-degree	10
Maximal out-degree	10





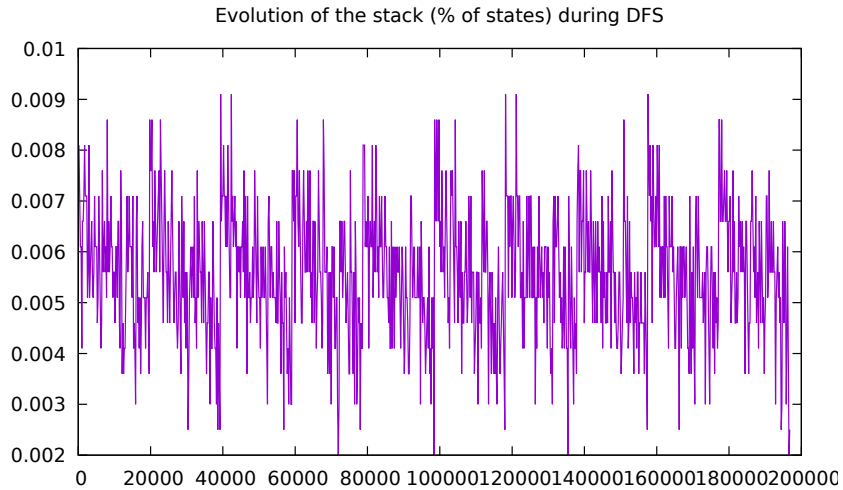
BFS information

Levels	20	
Back level edges	10	(0.00%)
Width	31390	(15.95%)
Max back level edge length	19	
Average back level edge length	19.0	



DFS information

Max stack size 20
Front edges 196830
Back edges 10
Cross edges 984160
Shortest cycle 20



Place bounds

	Min. cardinality	Max. cardinality	Min. multiplicity	Max. multiplicity
inactive	0	10	0	10
waiting	0	1	0	1
performing	0	9	0	9
sent	0	9	0	9
received	0	9	0	9
acks	0	9	0	9
mutex	0	1	0	1

Dead markings

Number of dead reachable marking(s): 0

Possible tokens

- 10 possible token(s) in place inactive

<(0)>
<(1)>
<(2)>
<(3)>
<(4)>
<(5)>
<(6)>
<(7)>
<(8)>
<(9)>

- 10 possible token(s) in place waiting

<(0)>

<(1)>

<(2)>

<(3)>

<(4)>

<(5)>

<(6)>

<(7)>

<(8)>

<(9)>

- 10 possible token(s) in place performing

<(0)>

<(1)>

<(2)>

<(3)>

<(4)>

<(5)>

<(6)>

<(7)>

<(8)>

<(9)>

- 90 possible token(s) in place sent

<(0, 1)>

<(0, 2)>

<(0, 3)>

<(0, 4)>

<(0, 5)>

<(0, 6)>

<(0, 7)>

<(0, 8)>

<(0, 9)>

<(1, 0)>

<(1, 2)>

<(1, 3)>

<(1, 4)>

<(1, 5)>

<(1, 6)>

<(1, 7)>

<(1, 8)>

<(1, 9)>

<(2, 0)>

<(2, 1)>
<(2, 3)>
<(2, 4)>
<(2, 5)>
<(2, 6)>
<(2, 7)>
<(2, 8)>
<(2, 9)>
<(3, 0)>
<(3, 1)>
<(3, 2)>
<(3, 4)>
<(3, 5)>
<(3, 6)>
<(3, 7)>
<(3, 8)>
<(3, 9)>
<(4, 0)>
<(4, 1)>
<(4, 2)>
<(4, 3)>
<(4, 5)>
<(4, 6)>
<(4, 7)>
<(4, 8)>
<(4, 9)>
<(5, 0)>
<(5, 1)>
<(5, 2)>
<(5, 3)>
<(5, 4)>
<(5, 6)>
<(5, 7)>
<(5, 8)>
<(5, 9)>
<(6, 0)>
<(6, 1)>
<(6, 2)>
<(6, 3)>
<(6, 4)>
<(6, 5)>
<(6, 7)>
<(6, 8)>

<(6,9)>
<(7,0)>
<(7,1)>
<(7,2)>
<(7,3)>
<(7,4)>
<(7,5)>
<(7,6)>
<(7,8)>
<(7,9)>
<(8,0)>
<(8,1)>
<(8,2)>
<(8,3)>
<(8,4)>
<(8,5)>
<(8,6)>
<(8,7)>
<(8,9)>
<(9,0)>
<(9,1)>
<(9,2)>
<(9,3)>
<(9,4)>
<(9,5)>
<(9,6)>
<(9,7)>
<(9,8)>

- 90 possible token(s) in place received

<(0,1)>
<(0,2)>
<(0,3)>
<(0,4)>
<(0,5)>
<(0,6)>
<(0,7)>
<(0,8)>
<(0,9)>
<(1,0)>
<(1,2)>
<(1,3)>
<(1,4)>
<(1,5)>

<(1,6)>
<(1,7)>
<(1,8)>
<(1,9)>
<(2,0)>
<(2,1)>
<(2,3)>
<(2,4)>
<(2,5)>
<(2,6)>
<(2,7)>
<(2,8)>
<(2,9)>
<(3,0)>
<(3,1)>
<(3,2)>
<(3,4)>
<(3,5)>
<(3,6)>
<(3,7)>
<(3,8)>
<(3,9)>
<(4,0)>
<(4,1)>
<(4,2)>
<(4,3)>
<(4,5)>
<(4,6)>
<(4,7)>
<(4,8)>
<(4,9)>
<(5,0)>
<(5,1)>
<(5,2)>
<(5,3)>
<(5,4)>
<(5,6)>
<(5,7)>
<(5,8)>
<(5,9)>
<(6,0)>
<(6,1)>
<(6,2)>

<(6, 3)>
<(6, 4)>
<(6, 5)>
<(6, 7)>
<(6, 8)>
<(6, 9)>
<(7, 0)>
<(7, 1)>
<(7, 2)>
<(7, 3)>
<(7, 4)>
<(7, 5)>
<(7, 6)>
<(7, 8)>
<(7, 9)>
<(8, 0)>
<(8, 1)>
<(8, 2)>
<(8, 3)>
<(8, 4)>
<(8, 5)>
<(8, 6)>
<(8, 7)>
<(8, 9)>
<(9, 0)>
<(9, 1)>
<(9, 2)>
<(9, 3)>
<(9, 4)>
<(9, 5)>
<(9, 6)>
<(9, 7)>
<(9, 8)>

- 90 possible token(s) in place acks

<(0, 1)>
<(0, 2)>
<(0, 3)>
<(0, 4)>
<(0, 5)>
<(0, 6)>
<(0, 7)>
<(0, 8)>
<(0, 9)>

<(1,0)>
<(1,2)>
<(1,3)>
<(1,4)>
<(1,5)>
<(1,6)>
<(1,7)>
<(1,8)>
<(1,9)>
<(2,0)>
<(2,1)>
<(2,3)>
<(2,4)>
<(2,5)>
<(2,6)>
<(2,7)>
<(2,8)>
<(2,9)>
<(3,0)>
<(3,1)>
<(3,2)>
<(3,4)>
<(3,5)>
<(3,6)>
<(3,7)>
<(3,8)>
<(3,9)>
<(4,0)>
<(4,1)>
<(4,2)>
<(4,3)>
<(4,5)>
<(4,6)>
<(4,7)>
<(4,8)>
<(4,9)>
<(5,0)>
<(5,1)>
<(5,2)>
<(5,3)>
<(5,4)>
<(5,6)>
<(5,7)>

<(5,8)>
<(5,9)>
<(6,0)>
<(6,1)>
<(6,2)>
<(6,3)>
<(6,4)>
<(6,5)>
<(6,7)>
<(6,8)>
<(6,9)>
<(7,0)>
<(7,1)>
<(7,2)>
<(7,3)>
<(7,4)>
<(7,5)>
<(7,6)>
<(7,8)>
<(7,9)>
<(8,0)>
<(8,1)>
<(8,2)>
<(8,3)>
<(8,4)>
<(8,5)>
<(8,6)>
<(8,7)>
<(8,9)>
<(9,0)>
<(9,1)>
<(9,2)>
<(9,3)>
<(9,4)>
<(9,5)>
<(9,6)>
<(9,7)>
<(9,8)>

- 1 possible token(s) in place mutex

epsilon

Liveness information

- Transition `update_and_send`

10 live bindings

[s = 0]
[s = 1]
[s = 2]
[s = 3]
[s = 4]
[s = 5]
[s = 6]
[s = 7]
[s = 8]
[s = 9]

0 quasi-live bindings

- Transition `receive_acks`

10 live bindings

[s = 0]
[s = 1]
[s = 2]
[s = 3]
[s = 4]
[s = 5]
[s = 6]
[s = 7]
[s = 8]
[s = 9]

0 quasi-live bindings

- Transition `receive_message`

90 live bindings

[r = 0, s = 1]
[r = 0, s = 2]
[r = 0, s = 3]
[r = 0, s = 4]
[r = 0, s = 5]
[r = 0, s = 6]
[r = 0, s = 7]
[r = 0, s = 8]
[r = 0, s = 9]
[r = 1, s = 0]
[r = 1, s = 2]
[r = 1, s = 3]
[r = 1, s = 4]
[r = 1, s = 5]
[r = 1, s = 6]
[r = 1, s = 7]
[r = 1, s = 8]

[r = 1, s = 9]
[r = 2, s = 0]
[r = 2, s = 1]
[r = 2, s = 3]
[r = 2, s = 4]
[r = 2, s = 5]
[r = 2, s = 6]
[r = 2, s = 7]
[r = 2, s = 8]
[r = 2, s = 9]
[r = 3, s = 0]
[r = 3, s = 1]
[r = 3, s = 2]
[r = 3, s = 4]
[r = 3, s = 5]
[r = 3, s = 6]
[r = 3, s = 7]
[r = 3, s = 8]
[r = 3, s = 9]
[r = 4, s = 0]
[r = 4, s = 1]
[r = 4, s = 2]
[r = 4, s = 3]
[r = 4, s = 5]
[r = 4, s = 6]
[r = 4, s = 7]
[r = 4, s = 8]
[r = 4, s = 9]
[r = 5, s = 0]
[r = 5, s = 1]
[r = 5, s = 2]
[r = 5, s = 3]
[r = 5, s = 4]
[r = 5, s = 6]
[r = 5, s = 7]
[r = 5, s = 8]
[r = 5, s = 9]
[r = 6, s = 0]
[r = 6, s = 1]
[r = 6, s = 2]
[r = 6, s = 3]
[r = 6, s = 4]
[r = 6, s = 5]
[r = 6, s = 7]
[r = 6, s = 8]
[r = 6, s = 9]
[r = 7, s = 0]
[r = 7, s = 1]
[r = 7, s = 2]

[r = 7, s = 3]
[r = 7, s = 4]
[r = 7, s = 5]
[r = 7, s = 6]
[r = 7, s = 8]
[r = 7, s = 9]
[r = 8, s = 0]
[r = 8, s = 1]
[r = 8, s = 2]
[r = 8, s = 3]
[r = 8, s = 4]
[r = 8, s = 5]
[r = 8, s = 6]
[r = 8, s = 7]
[r = 8, s = 9]
[r = 9, s = 0]
[r = 9, s = 1]
[r = 9, s = 2]
[r = 9, s = 3]
[r = 9, s = 4]
[r = 9, s = 5]
[r = 9, s = 6]
[r = 9, s = 7]
[r = 9, s = 8]

0 quasi-live bindings

- Transition send.ack

90 live bindings

[r = 0, s = 1]
[r = 0, s = 2]
[r = 0, s = 3]
[r = 0, s = 4]
[r = 0, s = 5]
[r = 0, s = 6]
[r = 0, s = 7]
[r = 0, s = 8]
[r = 0, s = 9]
[r = 1, s = 0]
[r = 1, s = 2]
[r = 1, s = 3]
[r = 1, s = 4]
[r = 1, s = 5]
[r = 1, s = 6]
[r = 1, s = 7]
[r = 1, s = 8]
[r = 1, s = 9]
[r = 2, s = 0]
[r = 2, s = 1]
[r = 2, s = 3]

[r = 2, s = 4]
[r = 2, s = 5]
[r = 2, s = 6]
[r = 2, s = 7]
[r = 2, s = 8]
[r = 2, s = 9]
[r = 3, s = 0]
[r = 3, s = 1]
[r = 3, s = 2]
[r = 3, s = 4]
[r = 3, s = 5]
[r = 3, s = 6]
[r = 3, s = 7]
[r = 3, s = 8]
[r = 3, s = 9]
[r = 4, s = 0]
[r = 4, s = 1]
[r = 4, s = 2]
[r = 4, s = 3]
[r = 4, s = 5]
[r = 4, s = 6]
[r = 4, s = 7]
[r = 4, s = 8]
[r = 4, s = 9]
[r = 5, s = 0]
[r = 5, s = 1]
[r = 5, s = 2]
[r = 5, s = 3]
[r = 5, s = 4]
[r = 5, s = 6]
[r = 5, s = 7]
[r = 5, s = 8]
[r = 5, s = 9]
[r = 6, s = 0]
[r = 6, s = 1]
[r = 6, s = 2]
[r = 6, s = 3]
[r = 6, s = 4]
[r = 6, s = 5]
[r = 6, s = 7]
[r = 6, s = 8]
[r = 6, s = 9]
[r = 7, s = 0]
[r = 7, s = 1]
[r = 7, s = 2]
[r = 7, s = 3]
[r = 7, s = 4]
[r = 7, s = 5]
[r = 7, s = 6]

[r = 7, s = 8]
[r = 7, s = 9]
[r = 8, s = 0]
[r = 8, s = 1]
[r = 8, s = 2]
[r = 8, s = 3]
[r = 8, s = 4]
[r = 8, s = 5]
[r = 8, s = 6]
[r = 8, s = 7]
[r = 8, s = 9]
[r = 9, s = 0]
[r = 9, s = 1]
[r = 9, s = 2]
[r = 9, s = 3]
[r = 9, s = 4]
[r = 9, s = 5]
[r = 9, s = 6]
[r = 9, s = 7]
[r = 9, s = 8]

0 quasi-live bindings